ADVENTURES IN TROPICAL SCIENCE FOR JUNIORS

Book 1

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Adventures in Tropical Science for Juniors

N. A. WATTS
B.SC., B.T., A.B.T.I.

Book 1

POST-GRADUATE BASIC TRAINING COLLEGE
Banipur, Po. Balgachi, 24 Pgs.

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FOREWORD

MOST young children come to school eager to learn. They are alive with curiosity, on edge to explore, among other things, the wonderland of Nature, animate and inanimate. Nature Study has rightly been since the beginning of this century an essential part of the curriculum of the Primary School child; but, unfortunately, it has in too many instances meant largely a dictated series of notes to be learnt by rote rather than a real, vital contact with Nature's wonders. And even where a good text-book has replaced the exercise book filled with dictated notes, it has been generally a text-book written for English or American children, which, while excellent in itself, has had little relevance to the Indian child.

To improve and make more relevant to Indian conditions the teaching of Nature Study or Primary School Science in Anglo-Indian Schools in West Bengal, an expert Committee met in 1954 under my Chairmanship to draft a suitable graded syllabus and suggest suitable methods of teaching this important subject in the Primary School. The outcome of its findings was published by Orient Longmans in a pamphlet entitled "Suggestions for the Teaching of Nature Study and General Science in Schools in India".

Mr. Watts, who was an active member of the above Committee, has based his series of admirable text-books on the syllabus and methods outlined in the above pamphlet, and has done an excellent job of work. His series of text-books appears to me to be particularly well-suited to the needs and interests of young children in India, and will, I am sure, prove stimulating both to children and to teachers not only in Anglo-Indian Schools but in other types of progressive schools all over India and in similar regions.

Adventures in Tropical Science fills a gap in the text-book field, and I am sure will be warmly welcomed by teachers and children. I wish it every success.

AUSTIN A. D'SOUZA, M.A., B.T.
DIP.ED. (LOND.), A.I.E. (LOND.)
Inspector of Anglo-Indian Schools, West Bengal

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BASIC TRAINING COLLEGE
Banipu
24-Pgs.

ADVENTURES IN TROPICAL SCIENCE

FOR JUNIORS

A simple introductory series
to the study of General Science
for schools in India

Book 1. For pupils up to the age of 8
Book 2. ” ” ” ” ” ” ” 9
Book 3. ” ” ” ” ” ” ” 10
Book 4. ” ” ” ” ” ” ” 11

PREFACE

THE conception of science taught in the primary school must not be falsified or distorted by an exaggerated importance placed on the accumulation of knowledge to be acquired and crude, inert blocks of data to be stored. The subject must be planned along lines that are vivid and unencumbered by the dead-wood of a formal tradition, quickened by inquiry, initiative and ingenuity; refusing to be distracted by methods which have for their criterion an attachment to conventional orthodoxies, rather than an appraisement of the essential needs and possibilities of the children themselves. New avenues should be explored, by which the pupils leave the beaten path and strike out fearlessly, predominated by curiosity, into new fields: which is the very soul of education. Assimilation and appreciation of science must be a lively, realistic process, cultivating the imagination and fostering social spirit; a stream in motion, not a stagnant pool.

In composing the four books in this series the author does not pretend to have made any startling discoveries or to have enunciated novel truths; rather is this an attempt to create and instil in the minds of children, according to their maturity levels, a provocative interest and an understanding of the wonder and variety of the world in which they live. Sedulously applied it may be expected to impart a meaning and motive to the child's initial experience of the miracle of life.

The teacher must formulate a philosophy of teaching adjusted to suit the conditions and needs of the neighbourhood. It should be flexible, adaptable and developing in its nature, subject to modification with the introduction of new evidence. In the ultimate analysis, each method of teaching should appeal to the emotion of the children, relying less on mass-instruction and more on the encouragement of individual and co-operative effort, resulting in the pooling of material and ideas, so that the school may be regarded not as the antithesis of life, but as its complement and commentary.

N. A. WATTS

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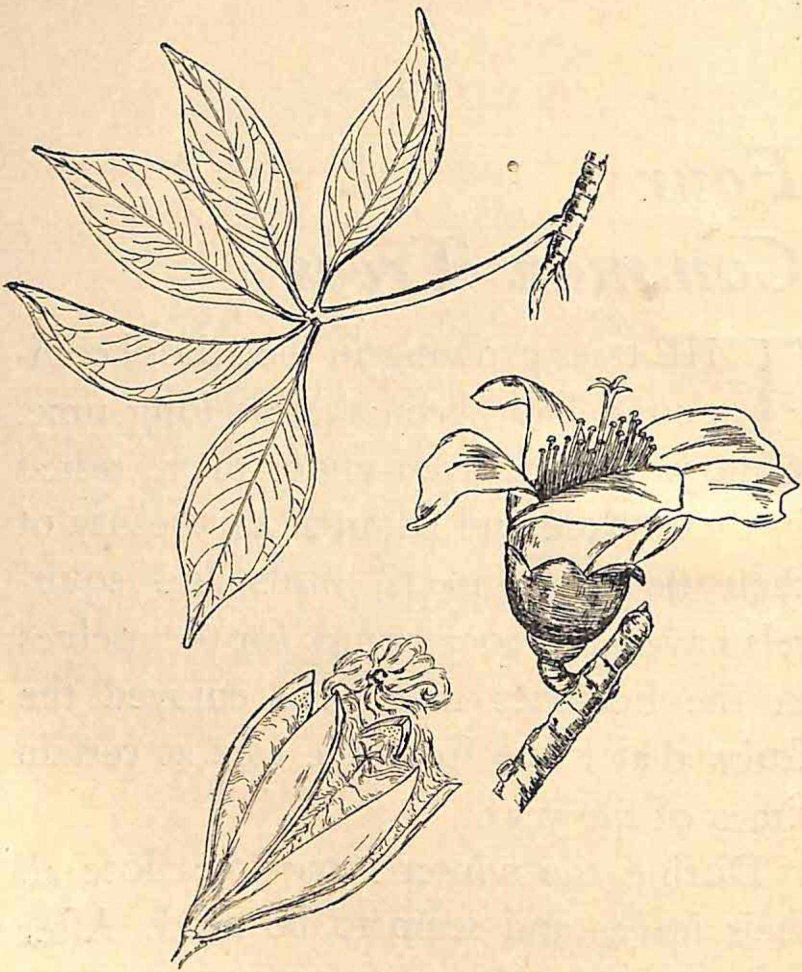
I

Four Common Trees

THE trees growing in the school compound have been there a long time. Children have played under them, rested in their shade and admired the beauty of their flowers. Insects, birds and squirrels have built cosy homes for themselves in the branches and have enjoyed the fruits that hang from the tree at certain times of the year.

During the winter some trees lose all their leaves and seem to be dead. After a few months, however, new leaves are seen, and we know that summer is on



The Red Silk Cotton

its way. In the hot season when covered over with pretty flowers, insect visitors hover around for a sip of the sweet juice, called nectar, that is found in the flowers.

You will know the Red Silk Cotton by its strange hand-shaped leaves. As summer approaches large crimson flowers burst out of plump, dark green buds, and cover the branches.

Birds of many kinds twitter in the tree-tops, pushing and shoving one another for a sip of delicious nectar. While still fresh the flowers fall to the ground and are eaten by cattle. Country-folk cook and eat the flowers and buds as a vegetable.

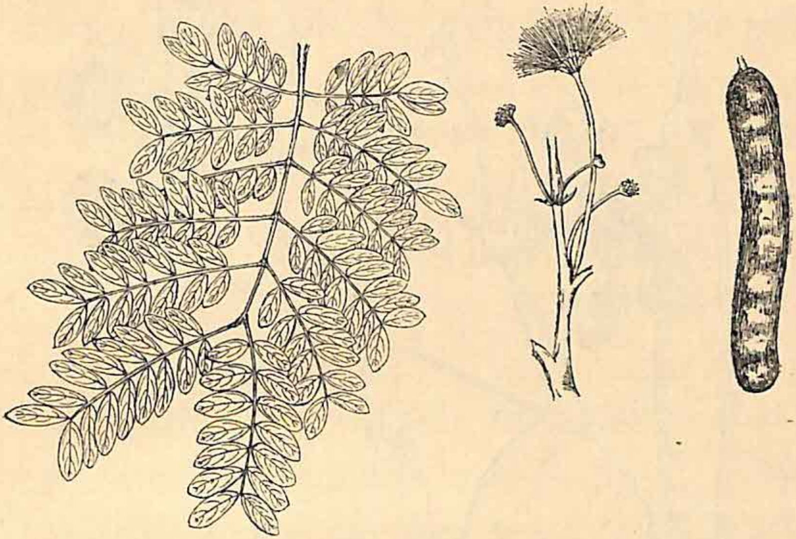
After the flowers fall off, the fruits

are able to be seen. They look like thick green fingers, which later turn brown and burst. Fluffy cotton floats to the earth. The tree now looks as if it is covered with snow. The cotton is useful for stuffing pillows and quilts. Every lad knows the use he can make of the pods. They make fine boats and it is fun to race them in the streams.

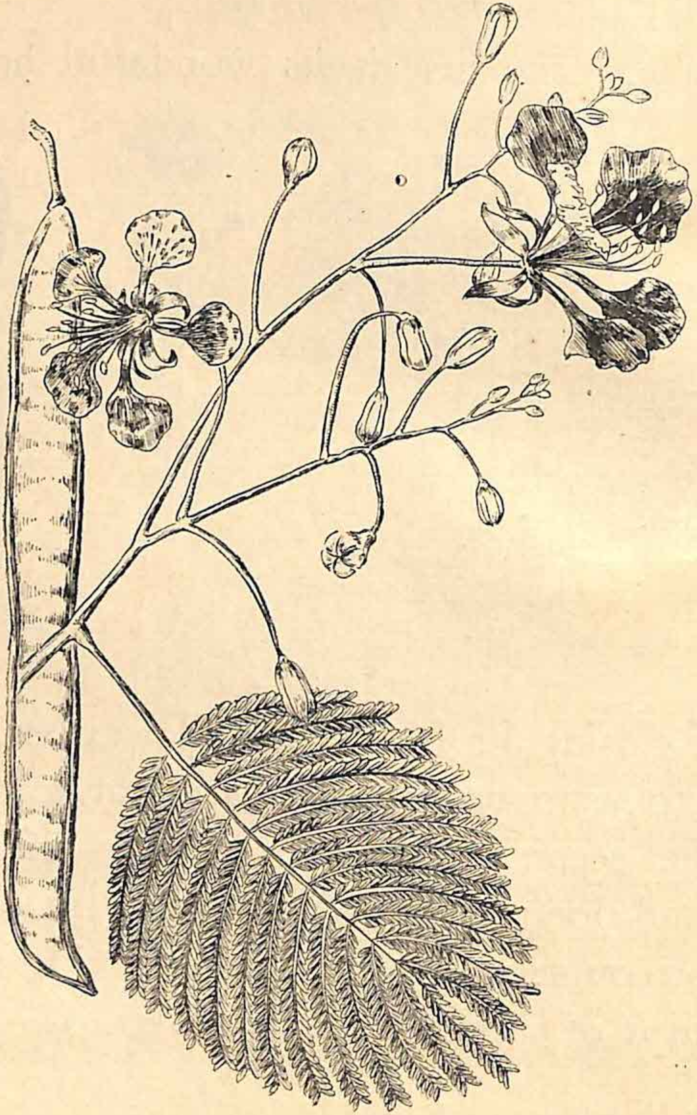
The Rain-tree grows to a large size and is easily recognized by its full, leafy head in which are scattered puffs of pinky-white flowers. If you inspect each 'powder-puff' you will see that it is made up of a number of small flowers.

People give two reasons for its odd

name. The first is its wonderful habit of closing its leaves in dull weather, as if to warn us that rain is about to fall. The second is that sometimes if we stand long enough under the tree, we find ourselves being sprayed with tiny drops of water. These drops, however,



The Rain-tree



Gul Mohr

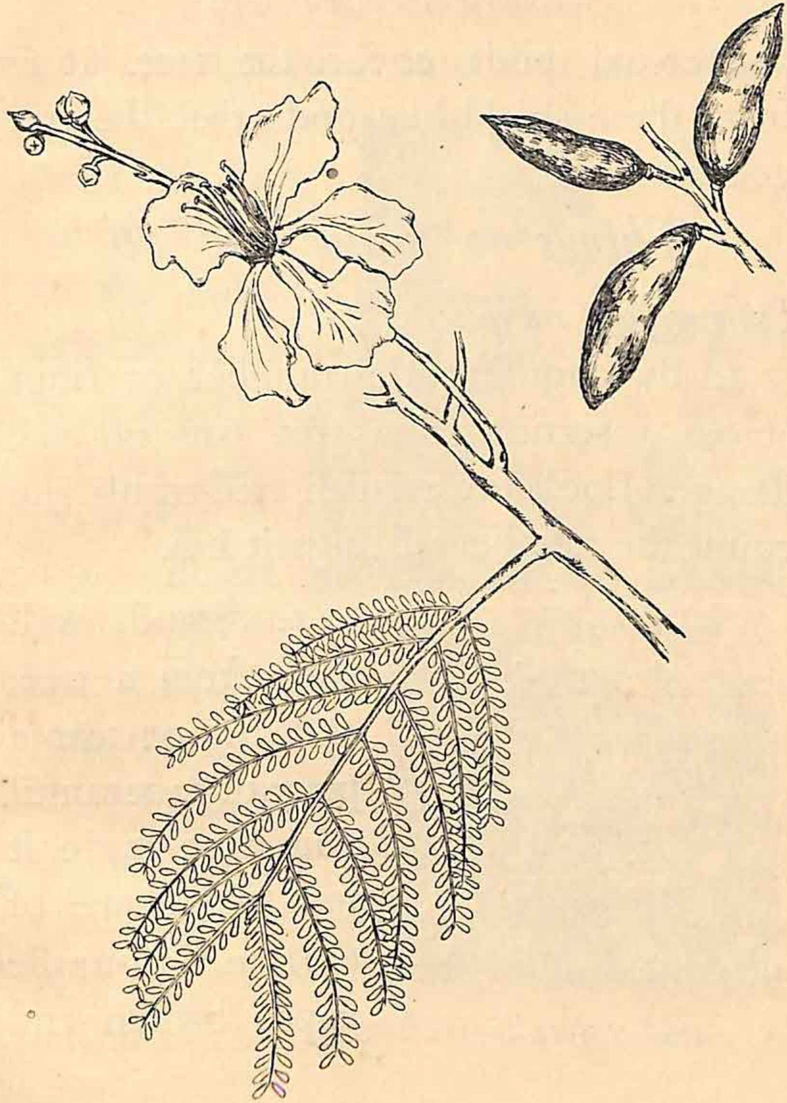
are caused by a large number of small insects biting the branches, making the sap ooze out.

There is no prettier sight than the Gul Mohr when it is in full bloom. The beauty of its form and flowers makes it a favourite shade tree for streets and lawns.

Nodding green buds burst their coats and unfold bunches of flowers. This happens when the tree is covered with pretty leaf-fans. Its bright scarlet flowers have given the tree its name, which means 'Peacock Flower'. The flower has five spoon-shaped petals, one of which is coloured differently from the rest.

In a few weeks the petals fall off the tree and form a red carpet on the ground below. Fruits now take the place of flowers. Boys like the fruits because they use them as daggers in their games.

At the beginning of the hot season, when every tree is seen dressed in its best, the brightest of them all is the Rusty Shield-Bearer. It is equally happy growing along the wayside as it is in compounds. It is a wonderful sight to see a street lined with these trees in full bloom. There is a special beauty in their rusty, downy buds which burst into spikes of golden blossoms. If you look closely at the flowers you will count five crinkly yellow petals. The flowers fill the air with a rich perfume. After the flowers are shed,



The Rusty Shield-bearer

copper-red pods cover the tree. It is from these shield-like pods that the tree gets its name.

Things to make and do

During your ramble:

1. By counting the number of rings across a section of a tree you can tell its age. Look for a fallen tree-trunk and count the number of rings it has.

How old is this tree?

2. Stand well back from a tree, and cut or tear a piece of paper until you have made it into the shape of the tree. Colour the paper brown and

green and paste it into your note-book.

3. Pin a piece of paper on a tree trunk. Now rub a piece of cobbler's wax or crayon against it. You will get a fine copy of the bark. Stick the result in your note-book.

Copying the pattern of the bark

4. Collect the leaves and flowers of four trees that you see on your ramble. Press them between newspaper under a heavy book. When they are flat and dry mount them, with the

help of scotch tape, into your note-book.

In your note-book:

1. Underneath your mountings, write down the months of the year. Against each month write down when the tree bore leaves, flowers or fruits.

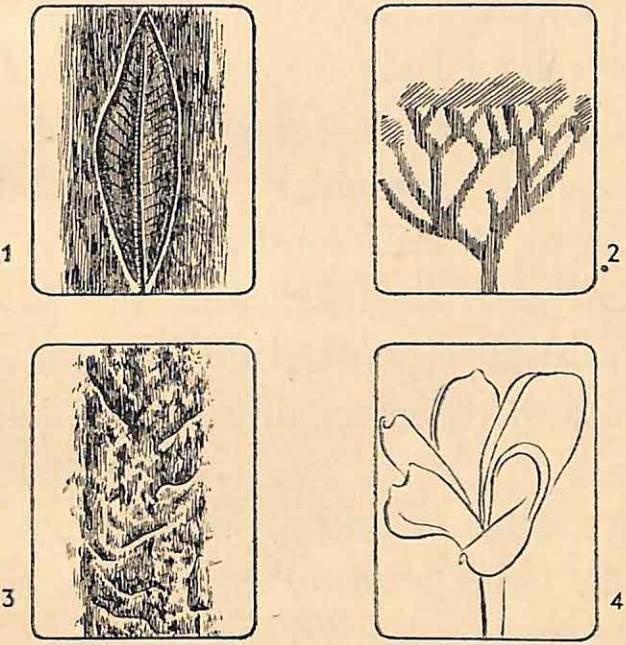
2. Name ten things that we get from trees, or that can be made from them.

For your wall newspaper:

Collect leaves from different trees. Cover them with carbon paper (blue side upwards) and place white paper on the top. Rub firmly. Now stick the carbon print on your board with the name of the tree from which you plucked it.

A card game:

Divide into groups of four. Make a set of four cards about each tree, i.e., a carbon print, a tree-shape, a bark-rubbing and a drawing of the flower. In this



A Set of Four Cards (*The Pagoda Tree*)
1. *Carbon Print* 2. *Tree Shape* 3. *Bark Rubbing* 4. *Flower*

way make sets of four trees. The game is played like Happy Families. Try to collect as many complete sets as you can.

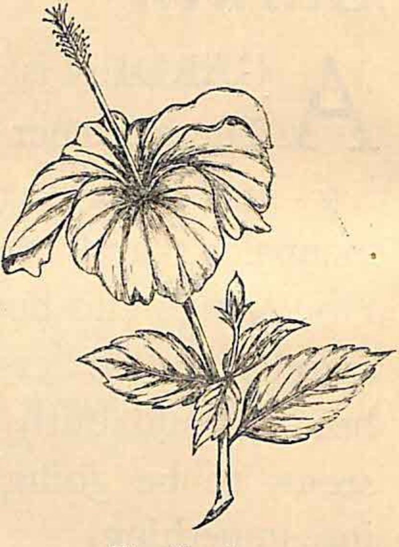
2

A Flower Garden

A GARDEN is a very beautiful place. The gardener is always busy working hard; digging, sowing, watering, manuring and trimming his plants. Honey-bees and butterflies flit to and fro among the flowers. Even the bumble-bee, big and burly though he is, always seems to be going somewhere and doing something.

Some plants grow in neat orderly rows. Others are bushy shrubs. There is the creeper growing on the porch and the rambler trying very hard to climb on to the roof. Each has a beauty all of its own which adds to the charm of the garden.

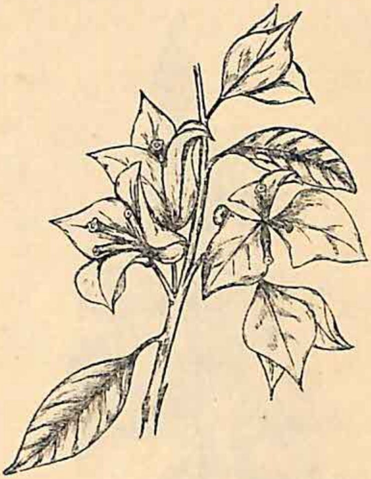
Large crimson flowers hang like bells from the branches of the Shoe-flower bush. When evening comes the flower that opened in the morning dies. Did you know that if you crush the flower and rub it on a pair of black shoes, it gives them a fine polish?



The Shoe-flower

The Bougainvillea grows very much like the hair on a little boy's head. Unless it is well trimmed from time to time it will soon look wild and untidy.

Gardeners tell us that if a Bougainvillea is grown in a flower-pot and kept down to a small size by cutting, it makes a very good pot-plant.



The Bougainvillea

Standing stiff and straight, like soldiers, are the Snapdragons. Children call the flowers 'Bunny-Rabbit flowers' and like to pinch them between finger and thumb to watch their mouths open. The flowers are often cut for vases as they remain fresh for many days.

A favourite with the gardener is the Sweet Pea. It makes a colourful patch

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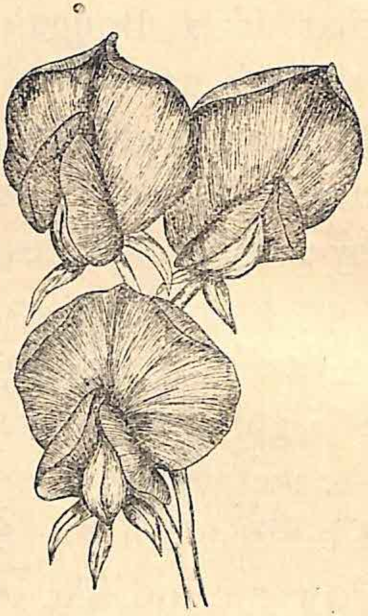
in the garden. After the plants have grown a few inches high the gardener puts sticks into the ground for them to twine around. Sometimes wire-netting is used to help them to grow.

The Snapdragon



The Sweet Pea

Things to make and do

In the garden:

1. Collect one flower from each kind of plant and keep it pressed in newspaper for a few days.

2. Try to understand what the gardener is doing.

In your note-book:

Keep a gardener's diary by filling in the table below, about as many plants as you can.

Name of plant	Date of sowing	Date first leaves seen	Date of flowering	Shades of colour	Height of plant	Date when fruits seen

For your wall newspaper:

Draw a large plan of the school garden every three months. In each flower bed stick a flower showing the plants growing there at the time. Print their names underneath.

Play these games:

1. Teacher will pass around a number of flowers. Smell them carefully and learn their scent. Now divide into groups, blindfold one another and see if you can guess the name of the flower your friend holds up to you.

2. Ten flowers will be spread out on Teacher's desk. Look at them for a few minutes. Then go and write down the names of as many flowers as you can.

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3

A Few Experiments

DURING your rambles in the garden you saw the care the gardener took over his plants. Each day (unless it rained), he watered them. Manure was added to the plants from time to time to make them strong. Around the garden he made a small fence to prevent cattle from eating his plants.

Plants grow in very much the same way as you do. They take food in large quantities, and breathe deeply.

Small plants have short roots as they do not need much water. The

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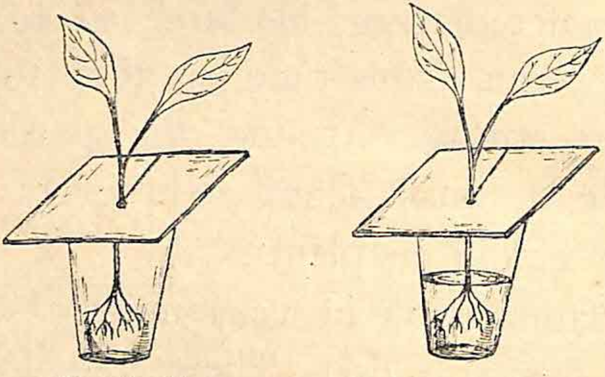
roots of trees, however, are longer because they need more water.

Let us see for ourselves the importance of water and food to the plant.

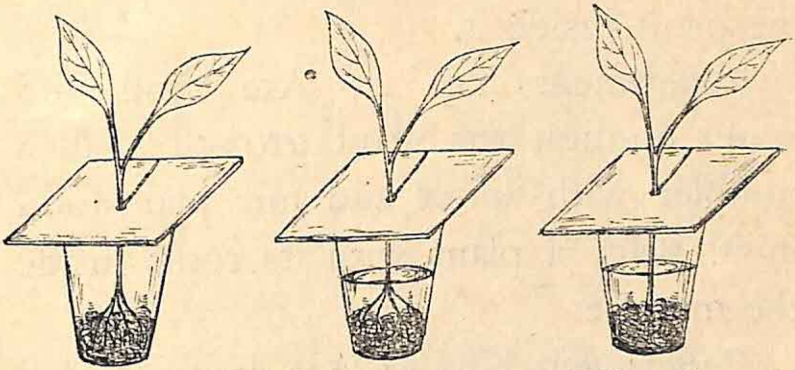
Pull five plants (of the same kind) out of the ground, carefully, for your experiments. Wash away all the soil from the roots.



First tumbler *Second tumbler*

In which tumbler will the plant go on living?

Experiment No. 1: Is a plant able to grow without anything? Place the roots of the first plant into an empty tumbler.



Third tumbler *Fourth tumbler* *Fifth tumbler*

Each plant is supported by a piece of cardboard that has been cut down to the middle.

Experiment No. 2: Is water the only thing needed by the plant? Place the roots of the second plant into a tumbler containing water.

Experiment No. 3: Is food* the only thing needed by the plant? Fill a tumbler

*The mixture is: Potassium nitrate 1.0 gm, Sodium chloride ·5 gm, Calcium sulphate ·5 gm, Magnesium sulphate ·5 gm, Calcium phosphate ·5 gm, Iron chloride—a trace. This recipe may be prepared by any dispensing chemist.

with plant-food and place the roots of the plant inside it.

Experiment No. 4: Are food and water enough for plant growth? Fill a tumbler with water and mix plant-food in it. Place a plant with its roots inside the mixture.

Experiment No. 5: Are roots needed by the plant to take in food and water?

Take the fifth plant and cut off its roots. Now place the lower end of the plant's stem into the mixture used in the fourth experiment.

The plant-food that you saw Teacher mixing with water is found in our earth and helps the plant to grow.

From the moment it begins life as a baby plant until it grows into a large tree it depends on the earth for its food.

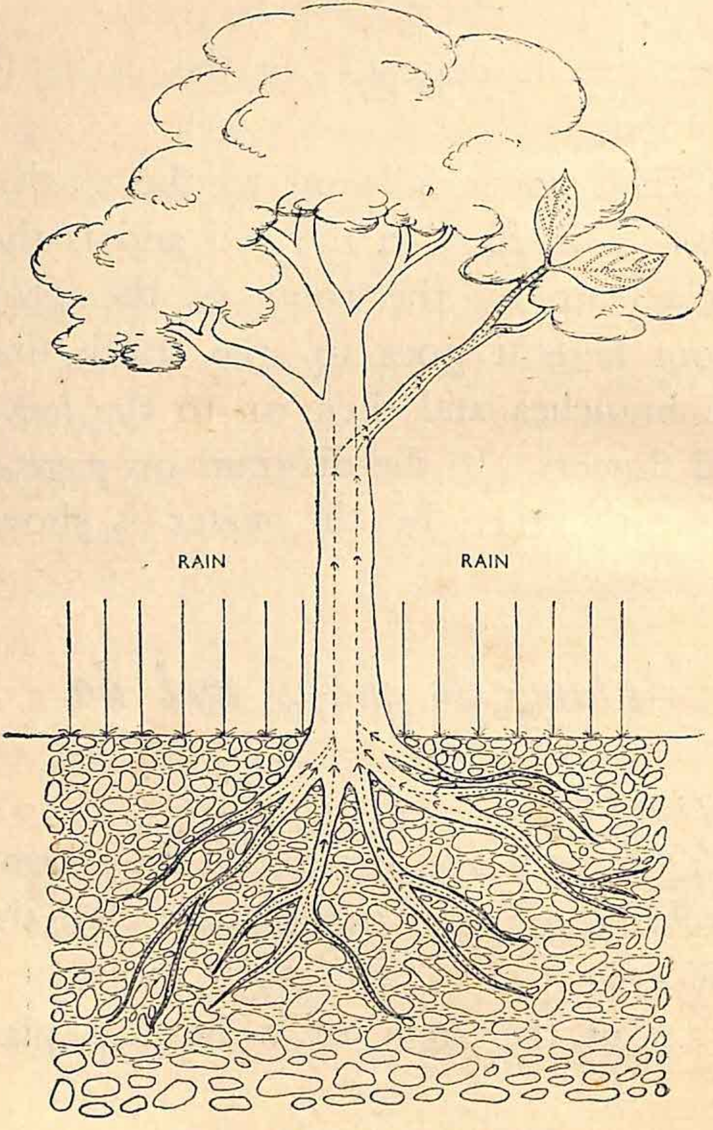
When water falls on to the earth it mixes with food in the soil and is then sucked up by the roots of the plant. From here it goes up the trunk, into the branches and then on to the leaves and flowers. In the diagram on page 26 the path taken by the water is shown by arrows.

Things to make and do

Outdoors:

1. Pull a few plants out of the ground, carefully, for your experiments. See that you collect them with their roots.

2. Cut the stem of a healthy plant



Water climbing to the top of a tree

just above the soil. Water will be seen to ooze out of the stem. This is water containing food on its way to the top of the plant.

For your wall newspaper:

By cutting up sheets of coloured paper make copies of the figures on pages 22 and 23. Underneath each write down the number of the experiment. Keep a day-to day record of what you see.

In your note-book:

Copy the questions given for each experiment. Write the answers in complete sentences.

Prove it yourself:

Look for plants bearing white flowers. Cut for yourself a stalk having a few flowers on it. Put them in a tumbler containing water to which has been added a little red ink. After a time you will find the colours of the flowers changing. Not only did the water go up the stalk, but it took with it the red colour of the ink. Repeat this experiment using inks of different colours.

4

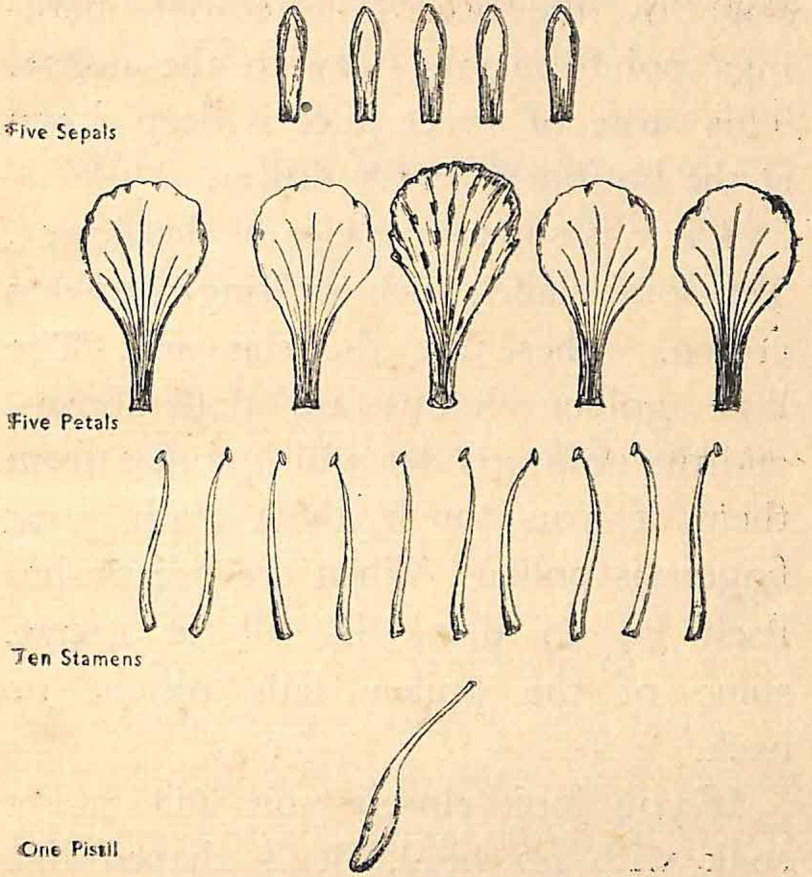
Looking inside a Flower

WHAT a wee thing a seed is ! How wonderful to know that a huge tree will grow out of it. When a seed is sown in the ground it is very exciting to wait for the baby-plant to appear. Is it not a pleasant surprise to find that the first green leaves have popped out of the ground? A new plant has been born. With water and care the plant will grow.

After some time the flowers arrive. Each flower is made up of brightly coloured petals and now welcomes insect visitors by preparing nectar for them. Many flowers attract insects by giving off a sweet scent from inside the petals, so that they may be smelt a long way off. The insects in their turn help the flowers to form fruits.

Five little green leaves, called sepals, enfold the Gul Mohr flower. They are just like a raincoat—for they keep the buds warm and dry. If you tear away the sepals the rest of the flower will be seen, neatly folded within. Every few days buds open showing five crimson petals.

The petal in the middle is coloured differently from the others. It is either white or yellow and is splashed with scarlet. This petal is used as a landing-



Parts of a Gul Mohr Flower

stage by the bee. The scarlet markings point out the way to the nectar. This store of sweet juice is deep down at the bottom of every flower.

There is something else in the flower. Ten long stalks, each wearing a golden crown. These are the stamens. The little golden lumps are pollen-boxes, and the gold powder which comes from them if you touch them with your fingers is pollen. When the bee pushes itself in, to drink its fill of nectar, some of the pollen falls on to its back.

If you look closely you will find a stalk with no head. It is shaped like a bottle and is found in the middle of the flower. This is the pistil. It is a very important part, because at the bottom of it is a swelling called the seed-box.

When pollen from the body of the bee brushes against the top of the pistil, a very wonderful thing happens—a fruit is formed.

Things to make and do

During your ramble:

1. Look at every flower you find. Pull it to pieces and point out to Teacher the sepals, petals, stamens and pistil.

2. Spend a few minutes in a garden looking at the different kinds of insects flying around. Learn their names and see which plants they visit.

In your note-book:

Make a list of plants that are flowering in the garden. Write beneath each the name of the insect that you have seen visiting it.

For your wall newspaper:

Take a number of flowers to pieces. Arrange the parts in rows as shown on page 31. Stick them to a sheet of paper on the board. Beside each row write the number of parts. If you know the name of the flower, write it on top of your mountings.

Can you name:

1. A red flower in which the sepals are joined together to form a cup?

2. A yellow flower in which the petals are separate.

3. A red flower with over twenty stamens.

4. A yellow flower with only one pistil.

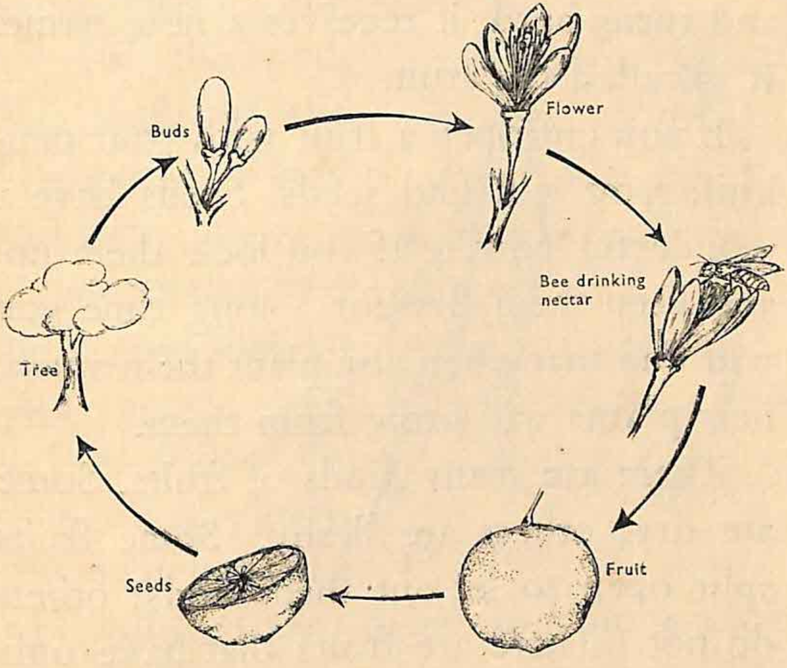
5

From Bud to Fruit

FLOWERS are lovely things. They have a very important work to do for the plant. Bees help to change them into fruits. When these insects search for honey they visit a large number of flowers. From each flower they collect a great amount of pollen on their backs.

If you are lucky enough to see a bee or butterfly closely, you will notice the yellow pollen-dust on its body. Some of this powder is rubbed, by accident, on the top of the pistil by the bee when it visits another flower.

In a few days a change takes place. The sepals, petals and stamens fall off. They are not needed any more, as their work is done. The lower part of the pistil—the seed-box is the only part of



The life-story of the Orange

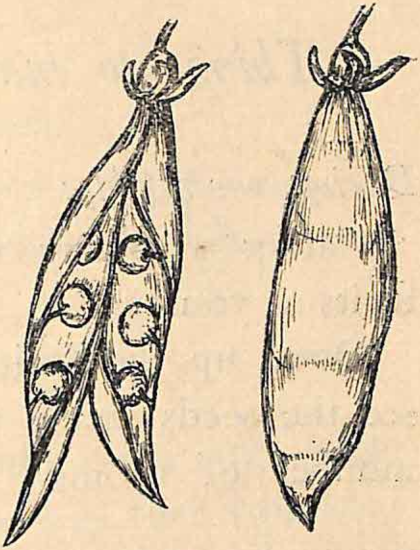
the flower which remains. Now its colour changes from green to brown or yellow. When the seed-box swells up and turns hard, it receives a new name. It is called the fruit.

If you cut open a fruit with your penknife you will find seeds. Seeds have a wonderful power. If you lock them up, and keep them dry for a long time you will find that when you plant them again, new plants will grow from them.

There are many kinds of fruits. Some are dry; others are fleshy. Some fruits split open to let out their seeds; others do not. There are fruits that have only one seed in them, and there are some with many seeds inside them.

A dry fruit with one room, in which

there are many seeds is the pea-pod. If you open it up or look at it when split, you will see the seeds on little stalks down one side of the pod. The walls of the fruit are very hard and thin.



The Pea pod

The orange is a fleshy fruit that has many seeds inside it. The flesh of the orange is very juicy. If you cut one open you will find that there are many rooms inside. Each room contains a few seeds.

Many kinds of fruits are eaten. From the fruit of the pea we eat only the seeds.

In the orange the fleshy part is eaten. Squirrels, birds and monkeys are also very fond of fruits.

Things to make and do

During your ramble:

Gather as many different kinds of fruits as you can.

Open up the fruits you collect and see the seeds inside them. Count the number of rooms.

In your note-book:

Write down the names of fruits you collect. Group them under these headings:

Dry fruits. Fleshy fruits. Fruits with

one seed. Fruits with many seeds. Fruits with one room. Fruits with more than one room. Fruits that split apart. Fruits that we eat.

For your wall newspaper:

Collect picture-labels from tins of fruit and jam. Paste them on your board.

Have an exhibition:

Arrange your fruits on a large table under the same headings that you used in your note-book. Under each fruit write its name and the name of the collector. Ask another class and the teacher to come and see your exhibition.

6

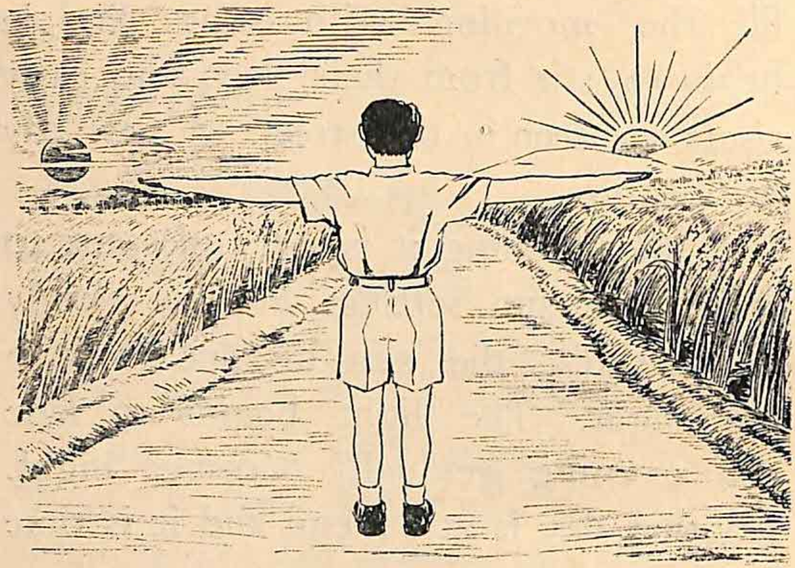
Sunlight and Shadow

EVERY morning the sun rises from the same side. It seems to move right across the sky, over our heads, and then go down in the opposite direction. When it rises it brings in day and when it sets day changes into night.

If you wake up early in the morning you will see the beginning of the day. At first there is a faint light which slowly becomes brighter. The glow deepens, and the sun, like a big ball of fire, comes out of hiding. Birds that were asleep in the branches awake and fill the morning with song. People begin to stir from their sleep and early risers are seen in the street. A new day has begun.

In the evening it is very pleasant to watch the sun setting. Sinking slowly and steadily, the sun disappears from our sight. The light begins to fade and evening gradually becomes night. Another day is at an end and it is time for bed.

The side from which the sun rises is called the east. Where it sets is the west. If you stand with your right arm pointing to the east and your left pointing to the west then you are facing the north, with your back to the south. Fishermen out at sea and farmers in



Finding direction

the fields find their direction in this way.

Whenever you walk in sunlight or lamplight your shadow goes along with you. Have you ever noticed how a shadow becomes longer and shorter with the movement of the sun? The direction of the shadow also changes.

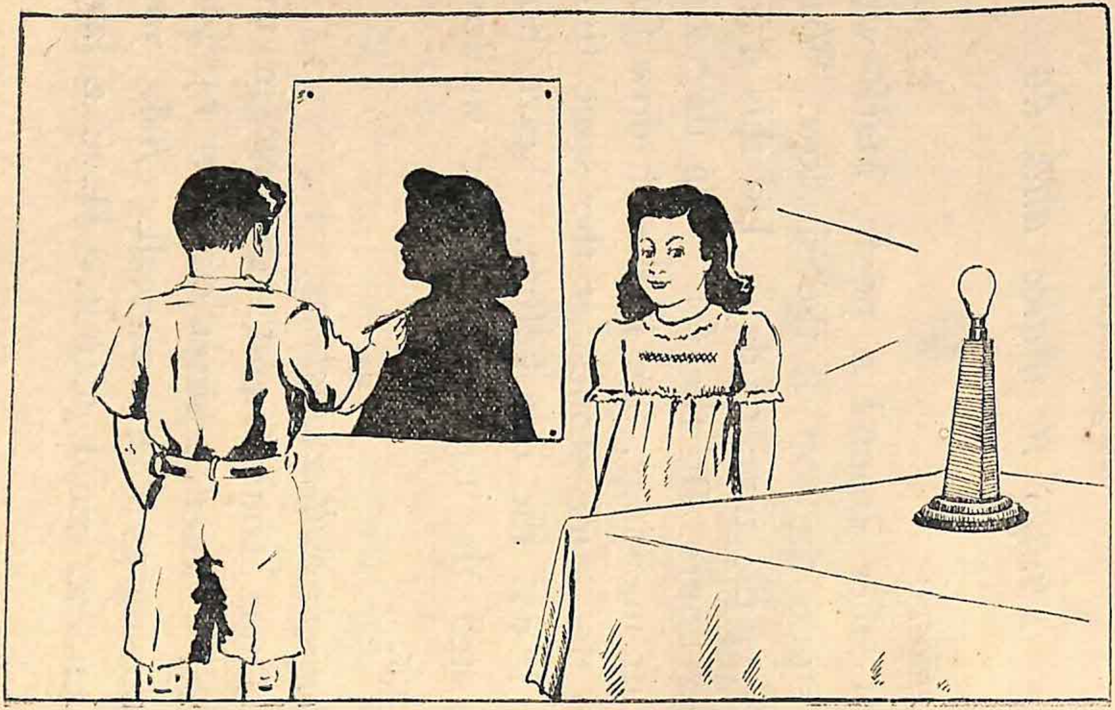
Things to make and do

Outdoors:

Gather around a post. Mark with a stone the top of the shadow. Write down the time of day. Do this every few hours. On the following day visit your markings. See if the shadow falls on the same stones, at the same time, as it did the day before. Learn how to tell the time from your shadow-stick.

For your wall newspaper:

Draw your friend's shadow in this way. Fasten a sheet of paper by four drawing-pins to a wall. Ask your friend to stand near it. Have a lamp



Drawing your friend's shadow

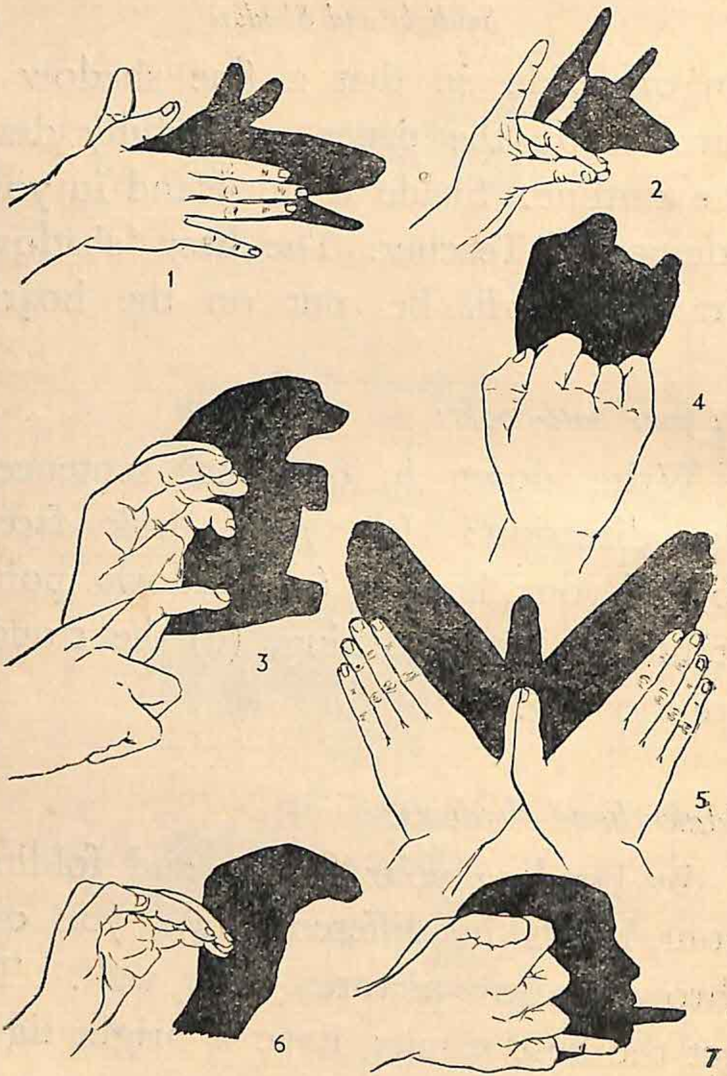
on one side so that a fine shadow is thrown on the paper. Carefully draw the outline. Shade it in. Hand in your attempt to Teacher. The best 'shadow-drawings' will be put on the board.

In your note-book:

Write down in complete sentences, the direction: (a) your desk faces, (b) of your house, (c) shadows point at nine in the morning, (d) the clouds are moving.

Make hand-shadows:

By bending your fingers and folding your hands in different ways you can throw shadow-pictures on a wall. To get the best results, have a bright light



Hand-shadows

1. *Dog.* 2. *Deer.* 3. *Bear.* 4. *Cat.* 5. *Butterfly*
6. *Cobra.* 7. *Man smoking a cigar.*

shining behind your hands. Some interesting patterns for you to follow are given in these pictures. After you have tried them, invent your own patterns. You will find it quite easy.

7

The Three Seasons

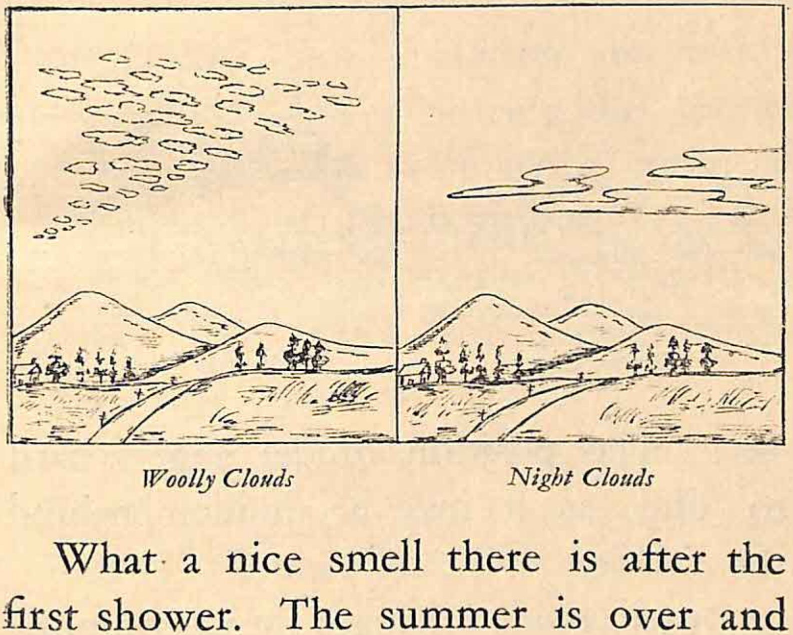
IN OUR country we have three different kinds of seasons. There are the hot season, the rainy season and the cold season.

During the summer the sky is clear. It is very hot and we welcome the shade given by trees. Light clothing is worn. Fans are continually spinning over our heads. People sweat a great deal, and everyone is thirsty. Even the plants look tired with their drooping leaves.

At last the weather becomes too

hot for school and the first term is over. The summer holidays now begin.

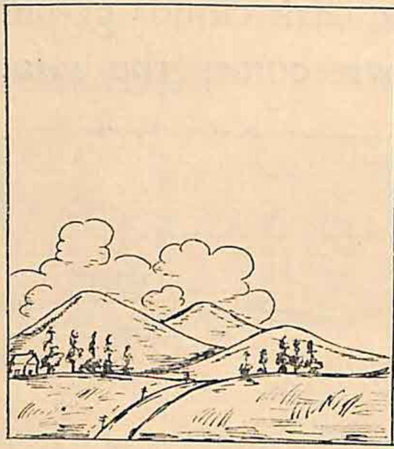
After a few weeks, dark clouds gather in the sky and down comes the rain.



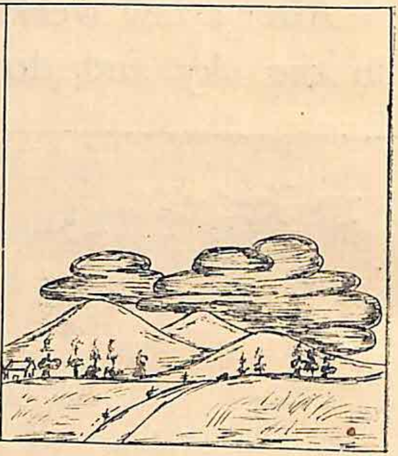
Woolly Clouds *Night Clouds*

What a nice smell there is after the first shower. The summer is over and the rainy season, called the monsoon, begins. What a difference there now is.

Small clouds, big clouds and very often a large dull cloud cover the sky. The position of the sun is hard to find as it may be hidden behind the clouds.



Summer Clouds



Monsoon Clouds

Dusty roads change into a muddy mess. Tarred roads become slippery. Along the way are many puddles, which like mirrors, show us our faces when we peep into them. Trees drip water from their leaves, forming tiny pools around the trunk. Fields are covered with grass. The gardener spends less time watering his plants. He is now busy clearing his garden of the weeds that seem to be springing up everywhere. Snakes come out from hiding, and frogs are to be heard at night. The insects that gather around lights now increase in number.

Thunder is heard and lightning seen. Thunderstorms cause a great deal of damage. Branches break from trees and lie across the path. Small cottages are smashed. Some rivers overflow their banks. Even roads are sometimes flooded.

We may start out for school with a blue sky over our heads, yet when the bell rings for the end of school the rain may prevent us from leaving at once. No one can be certain if the weather will be fine or not.

When clouds change their colour from dark grey to white, we know that the monsoon is almost over and winter is on its way. The puddles dry. Playtime is shortened for it becomes dark early. Soon there is a chill in the air and warm clothes are worn. The cold weather has arrived. In the middle of the cold weather a new year begins in which the three seasons will be repeated.

Things to make and do

In your note-book:

1. Divide the months of the year into the three seasons.

2. Write down three things that you see when a storm is on its way.

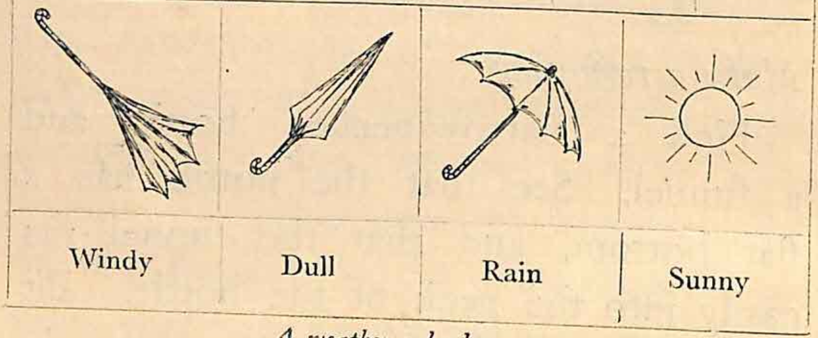
During your ramble:

After a heavy shower take note of all the changes you see.

Make a rain-gauge:

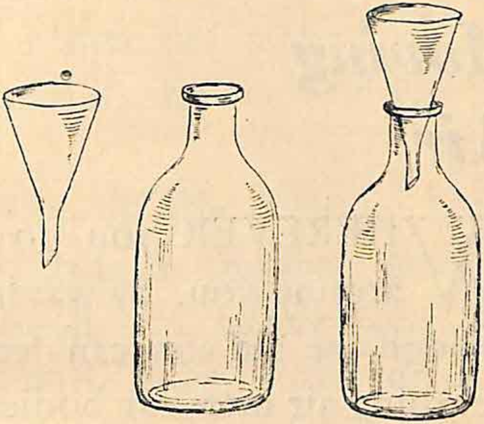
Find a narrow-necked bottle and a funnel. See that the bottle has a flat bottom, and that the funnel fits easily into the neck of the bottle. Fit your rain-gauge together as shown in the drawing. Leave it standing out in

Weeks	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
First Week					
Second Week					
Third Week					
Fourth Week					



A weather calendar

the open where rain will fall into it. Let it remain in the same place for a whole day. Now, with the help of a ruler measure the amount of water collected in the bottle. This will show how much rain has fallen during the day.



Make this rain-gauge

For your wall newspaper:

Make a weather calendar. Fill in the spaces correctly with the signs shown. Do this day by day.

8

Moving Air

WHEREVER you go there is air around you. By waving your hand through the air you can feel it. We are breathing air into our bodies all the time and know that it has no smell. Because it has no colour we say it is colourless.

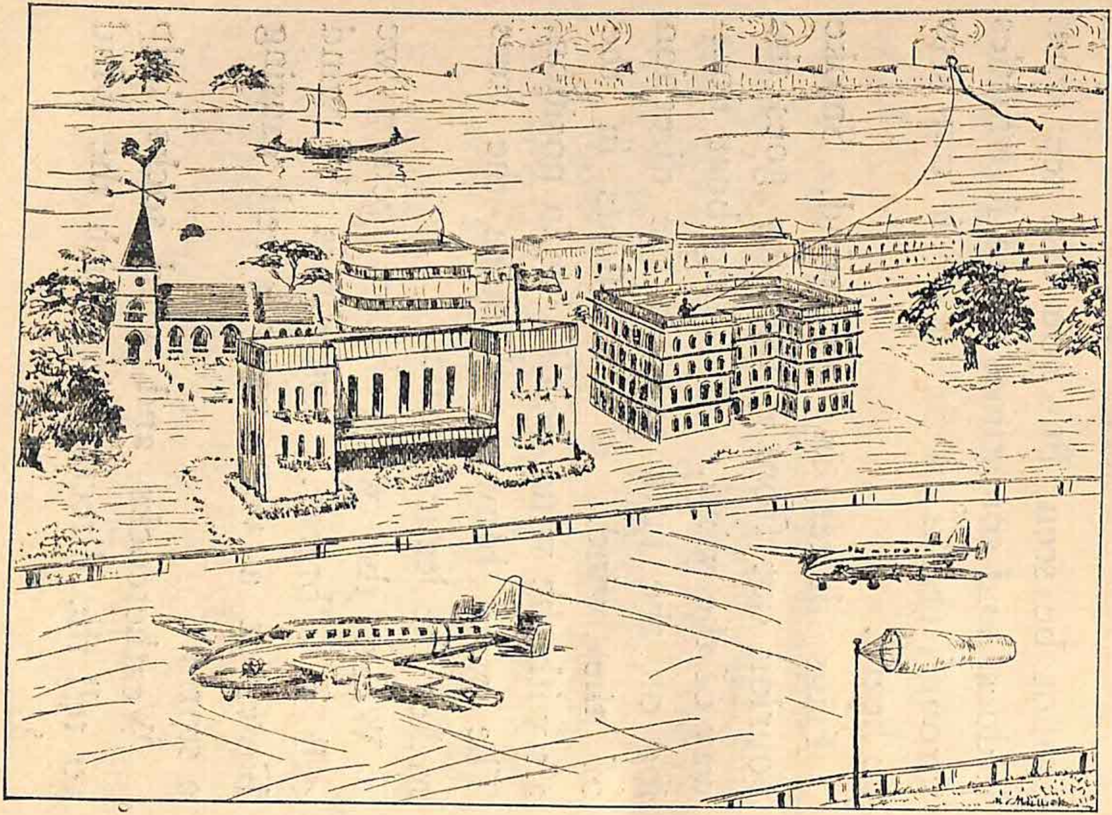
Take an empty tumbler and place it upside down in a bowl of water. If you tilt the tumbler slightly, you will see air bubbles.

Sometimes the air is quite still. When it moves about from place to place it is called a wind. The wind cannot be seen, but you can see what it does, and sometimes when it whistles through cracks in the door it can also be heard.

Flags flutter in the wind. Smoke pouring out from a chimney goes the way of the wind. A sailing boat floating on the tank sails in the direction of the wind. A kite floats in the air with the wind holding it in position. The wind blowing through the trees makes the leaves rustle.

When the wind blows gently we call it a breeze. Sometimes the wind blows at a very great speed causing a storm.

Weathercocks and wind socks help to tell the direction in which the wind

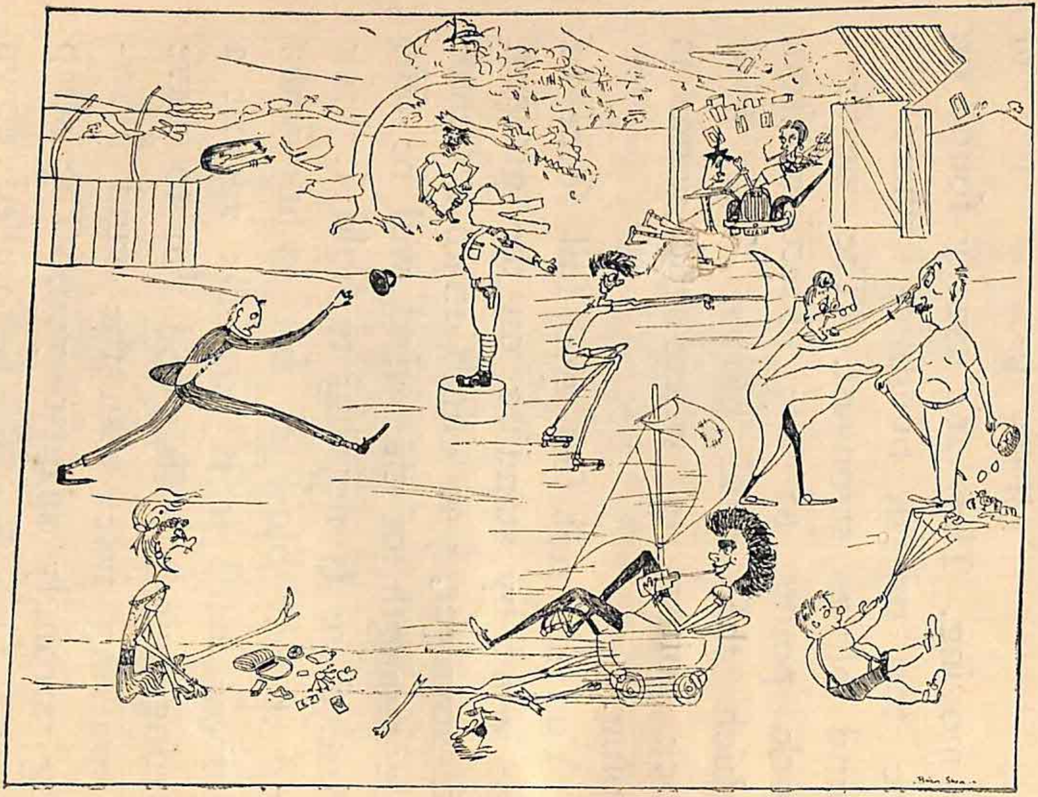


Find the mistake in this picture

is moving. They are usually found on the top of tall buildings where the wind blows strongest. The weathercock points to the direction from which the wind blows. The wind sock points to where the wind is going.

You do not feel the full force of the wind by standing on the ground. If, however, you climb on to a terrace the strength of the wind will be felt. Here there is nothing to hold it back and it may blow as fast as it wants.

How hard it is to walk against a strong wind. It is good fun to have a walking race with the wind blowing strongly against you. The strap of your hat has to be pulled down

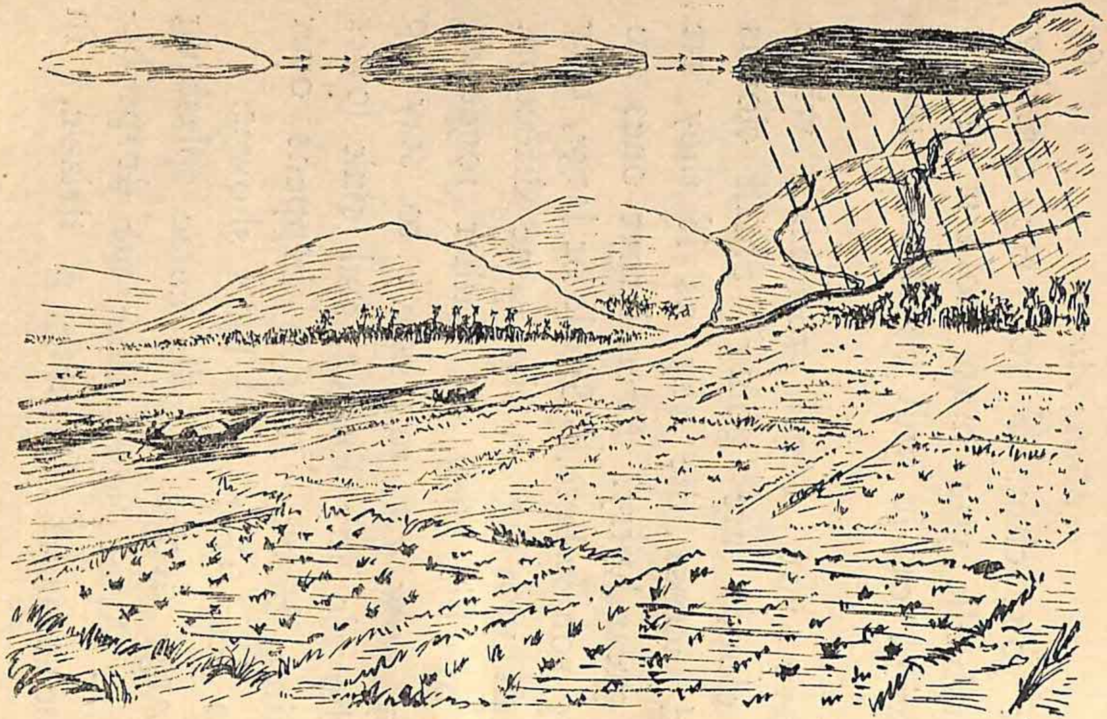


A windy day

under your chin. If you are carrying an umbrella you must hold it against the wind or it will be blown inside out.

Have you ever wondered where the clouds are going? Small clouds speed across the sky as if they are in a great hurry. Even larger ones are going somewhere. Small or large, they are all moving in the same direction. Bit by bit they all gather together. They now get too heavy to stay up in the air any longer, and sink lower turning black. If this happens over your head there will be a shower.

Large drops of rain come splashing down. After some time the drops become smaller, forming a drizzle. In



The beginning of a river

this way the dark clouds come down and the lighter ones continue on their journey. When they reach the mountains a few float over, others fall as rain.

The rain which falls on mountains forms streams. A number of streams join together to make a river. Is it not strange to think that the clouds passing over our heads will one day be part of the river?

Things to make and do

In your note-book:

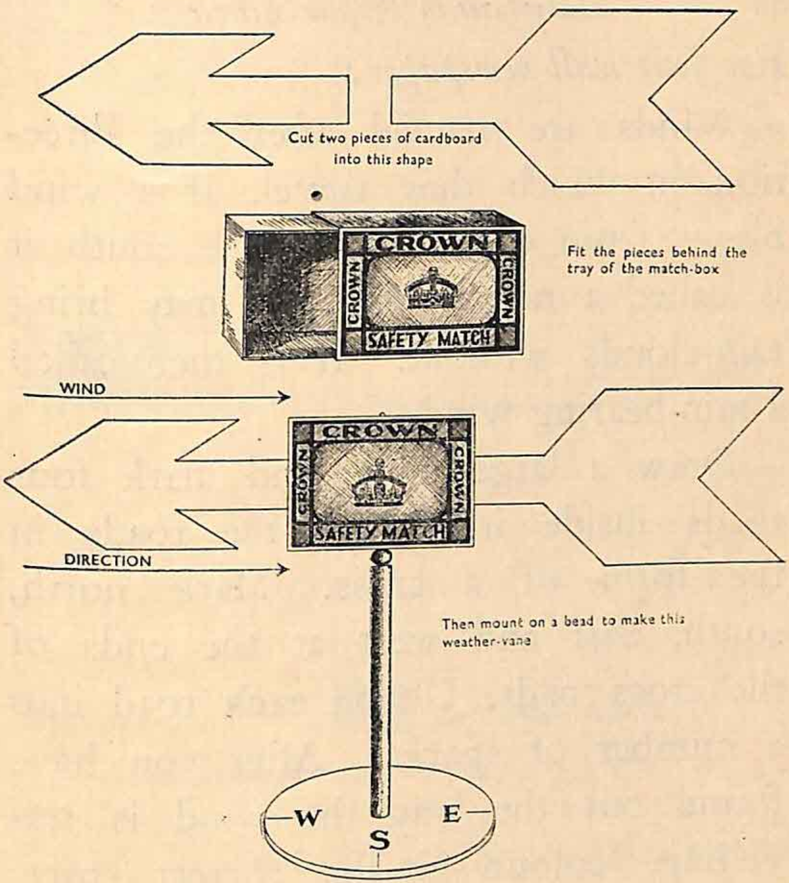
Make drawings of three things you carry to school to save your clothes from the rain.

Make a weather-vane:

Cut two pieces of cardboard into the shape shown in the drawing. Take a match-box and pierce two holes in the match-striking sides. Fit the arrow behind the tray. Pass a nail through the holes in the matchbox and mount the vane on a bead. Cut a piece of cardboard into the form of a circle. Mark on it north, south, east and west. Now fix it to your vane.

Outdoors:

Make daily visits to your weather-vane and note the direction of the wind. Remember that the arrow points to the direction from which the wind is blowing.



Cut two pieces of cardboard into this shape

Fit the pieces behind the tray of the match-box

Then mount on a bead to make this weather-vane

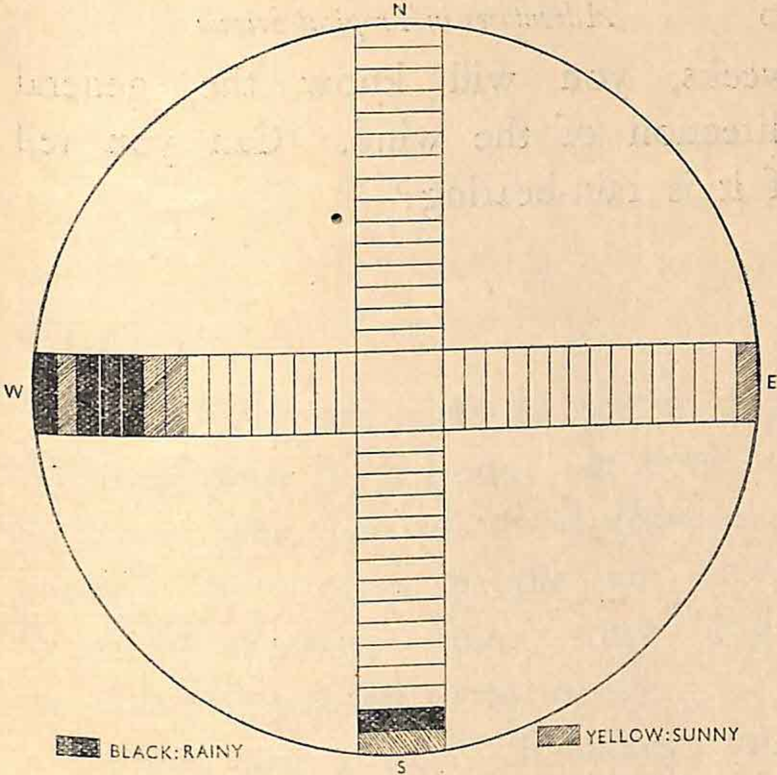
Make this weather-vane

For your wall newspaper:

Winds are named after the direction in which they travel. If a wind blows from the north to the south it is called a north wind. It may bring rain-clouds with it. It is then called a rain-bearing wind.

Draw a large circle and mark four roads inside it. Make the roads in the form of a cross. Mark north, south, east and west at the ends of the cross-roads. Divide each road into a number of spaces. After you have found out the way the wind is travelling, colour in the correct space. Shade towards the centre. Do this day by day.

After filling in your chart for a few



A circle which shows the general direction of the wind

Days	*From*	*To*	*Wet or Fine*

weeks, you will know the general direction of the wind. Can you tell if it is rain-bearing?

9

Pets

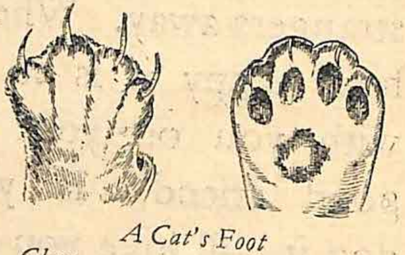
IT is a very sad sight to see a dog that belongs to nobody. It lives in the street and gets its food from the gutter. Very often people are cruel to such animals. Many stray dogs are killed by passing motor-cars.

Do you keep a dog? It makes a fine pet. It watches over your home and keeps strangers away. When you return home, how happy it is to see you! It goes with you on your rambles and is a good friend. If you care for your dog it will love you all the more.

Another favourite pet is the cat. It is a soft, cuddly animal and purrs happily when it is stroked.

During the day a cat loves to curl up on a soft cushion and enjoy a quiet doze. Sometimes it carefully licks itself all over, and in this way keeps clean. At night it becomes more active and has a liking for out-of-doors.

Cats leap well and always land on all four feet. If you look at a cat's foot, you will see the cushions underneath. These cushions help the animal to walk along quietly. If you gently press its toes, the



A Cat's Foot

Claws out *Claws in*

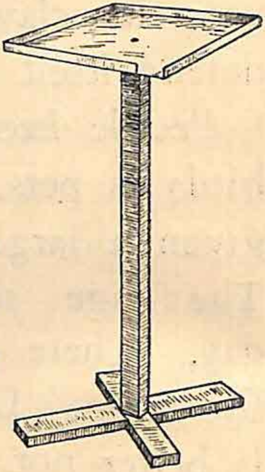
claws will be thrust forward. The cat uses its claws to climb trees and to defend itself against its enemies.

People keep many different kinds of birds as pets. Birds should always be given a large cage in which to live. The cage should be cleaned every day. There must be food and water for them. Unless you can do this it is better not to keep them.

But if you want to make friends with birds you do not have to keep them in a cage. You can feed them by spreading crumbs on your window-sill. They will soon become very tame.

Make a bird-table with the lid of a biscuit-tin, a pole and two flat sticks.

Place it in a quiet place under the shade of a tree. Fruit, bread, seeds, nuts and meat attract different kinds of birds. Watch them as they feed. Try and find out their names. Remember to clean the bird-table every day.


Make this bird-table

During the summer when most birds are making their homes, an earthen pot or coco-nut shell placed in the branches of a tree may be used by them.

It is a great shame to rob baby birds from their mother's nest. If, however, you happen to find a sick bird, or a young one that has fallen from a nest, it will be splendid of you

Homes for birds

to try to nurse it back to good health.

Things to make and do

During your visit to the Zoo:

Cats and dogs have many wild

cousins that are found in our jungles. Look for them at the Zoo.

In your note-book:

Stick feathers of three different kinds of birds, found on your rambles, into your note-book. Under each write the name of the bird and the food it eats.

For your wall newspaper:

Make a collection of pictures showing different kinds of cats and dogs. Bring them to class for the wall newspaper.

Have a pet-show:

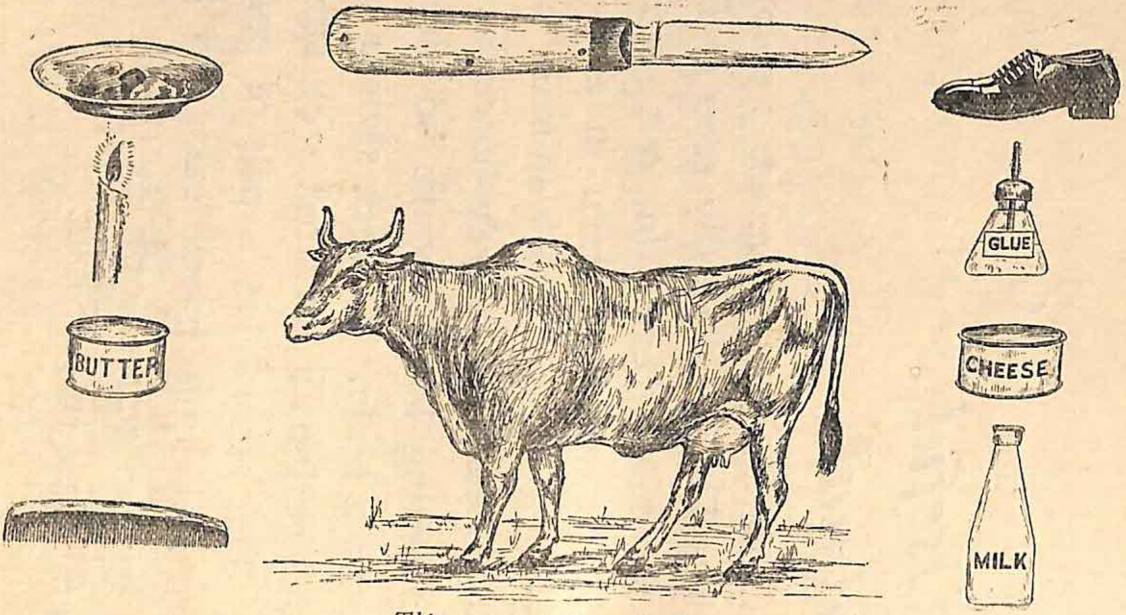
Ask your friends to bring their pets to your house. Ask father to judge which pet is being cared for best of all.

10

A Useful Animal

IN OUR country, cows are a common sight. They are usually seen in fields and sometimes even in our bazaars. People do not hurt them in any way as they are very useful animals.

The cow is a sturdy animal with short, strong legs, just fit to support so heavy a body. Its thick skin is called hide. The hide is covered with smooth hair. The animal has a pair of pointed horns and long broad ears. Its large eyes have a gentle look in them. The tail ends in a tuft of hair.



Things we get from the Cow

On each leg there are four toes. The two in front are hard and are called the hooves. The two behind are short and never touch the ground. When they walk they leave marks on the ground called hoof-prints.

When cows graze, they tear off mouthfuls of grass and gulp them down. After they have eaten enough they lie down to rest. Their jaws now move all the time. They are chewing the cud. By this is meant that they are eating their food for the second time.

The baby of the cow is called the calf. Its mother feeds it on milk. The milkman takes some of this milk and keeps it for us. It is a very good food and helps our bodies to grow strong. Milk can be made into butter and cheese.

The cow has other important uses. The flesh is called beef and is eaten as food. Combs and the handles of knives are made from its horns. From the fat of the cow candles are made. Glue is made by boiling the hooves and horns together. Leather is made from the hide.

Things to make and do

Outdoors:

Visit a cowshed and look for hoof-prints. Carefully watch the movements of the animal's jaws when it is chewing the cud. Ask the milkman to show you how he milks the cow. Can you tell why it moves its tail and ears so much? Of what use are the horns to the animal?

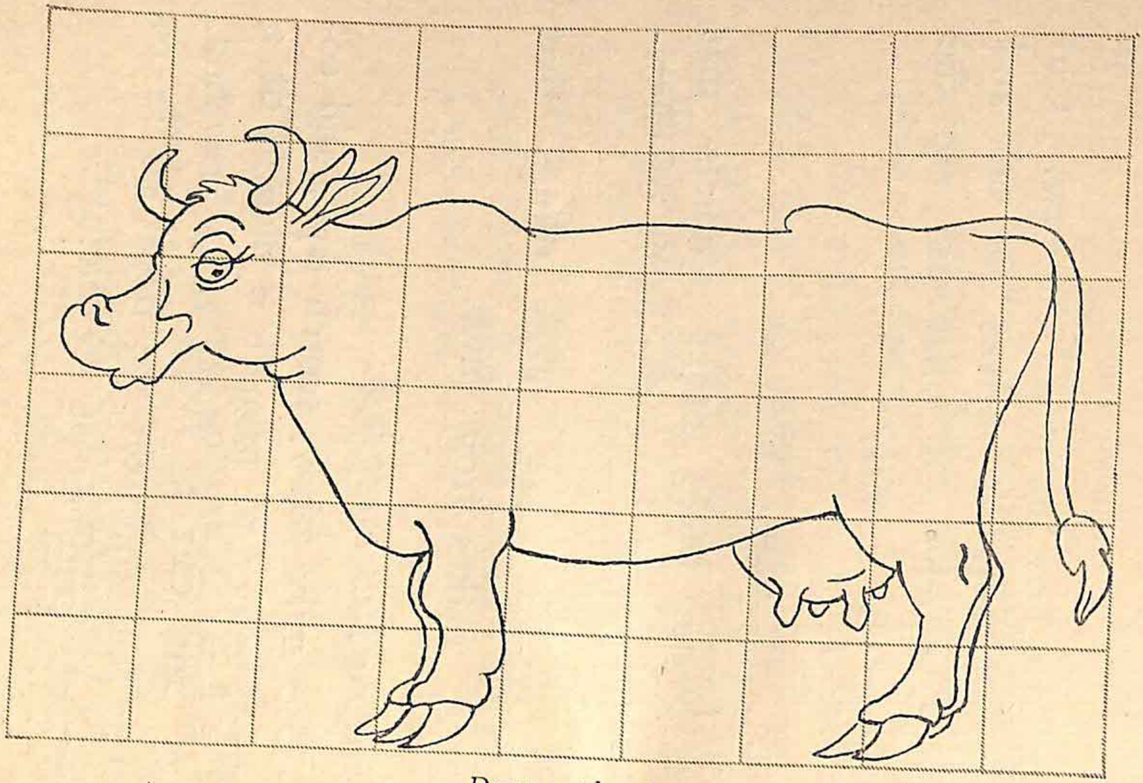
In your note-book:

1. Name three other animals that give milk and have the habit of chewing the cud.

2. Write down three things that mother makes from milk.

For your wall newspaper:

Use only straw, scotch tape, and coloured paper to prepare a picture of a cow and calf in front of a cowshed. Stick the straw on the paper so as to form the outlines of the picture.



Draw me please!

Draw this:

First draw the empty boxes with the help of a ruler. Then copy the drawing of a cow on the opposite page. See that your lines and curves come into the correct positions.

II

An Underwater Garden

HOW quiet and peaceful a tank looks. Inside it, however, a fierce battle is raging. Little fish are swiftly darting about to avoid larger fish. Small insects hide under stones to save themselves from being eaten by fishes and frogs. Snakes and water-birds are looking for fishes and frogs to eat. The lives of animals in a tank are full of danger.

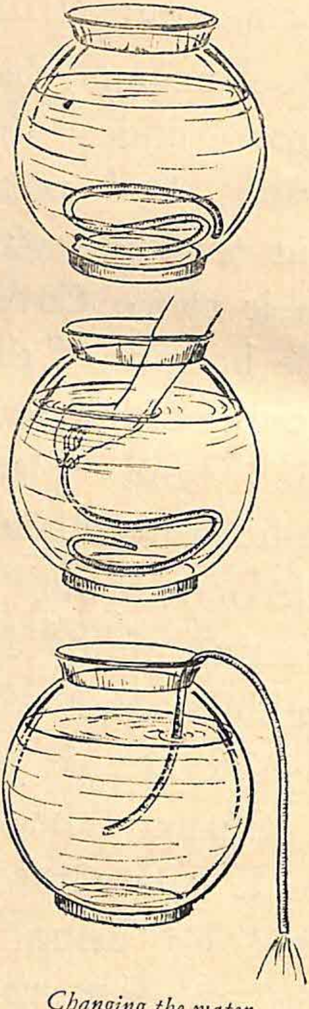
If you can find a glass bowl, make your own little pond. Collect fish from a nearby pond and care for them yourself. Find some plants in the same pond that grow under the water. Pull them out together with their roots. Cover the bottom of the bowl with clean sand and plant your water-plants.

An underwater garden

Decorate your underwater garden by putting into it shells and a few pebbles. Feed the animals with special fish food that is sold in packets.

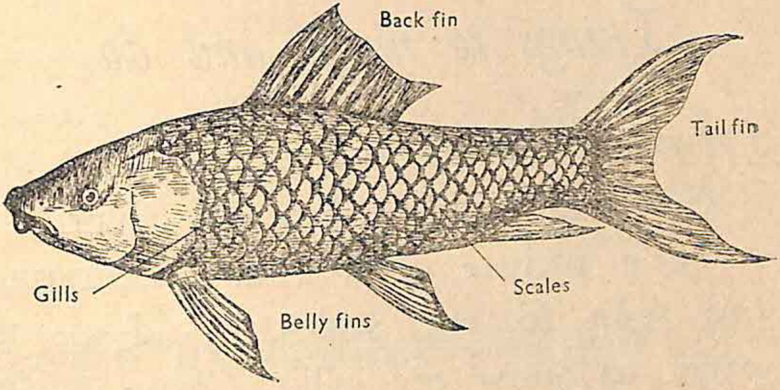
Change the water every day and refill your bowl with tap-water. Do this by using a rubber tube. Place the tube in the water and let it fill up. Now pinch one end and bring it over the side of the bowl. The tube will drain out the water. Be careful not to drain off all the water; leave a little in the bowl and then gently pour in fresh water.

Look at a fish swimming in your bowl. The two arm fins help the fish to balance. It moves by a sudden shake of its tail. Its body is covered with scales which are of



Changing the water

different colours. Sometime the scales have a silver colour and they shine as the fish goes flashing through the water.



Parts of a fish

We know that air is found in water because when water is boiled, air comes out as bubbles. A fish keeps opening its mouth all the time. When it does this the water goes into its body and out again through the gills. Air is taken from the water in this way and is used by the fish to breathe.

Things to make and do

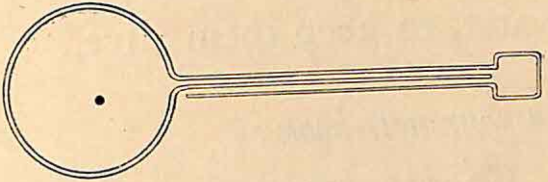
For your wall newspaper:

Cut and fold coloured paper to make a picture of a fish. Everyone can help to cut scales. Fold tissue paper to show the gills. Paste sticks on to the paper to make fins.

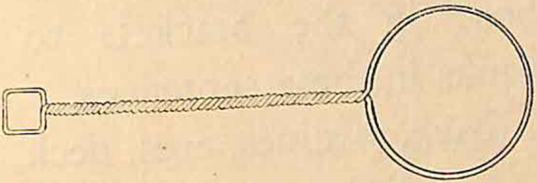
Make a fishing-net:

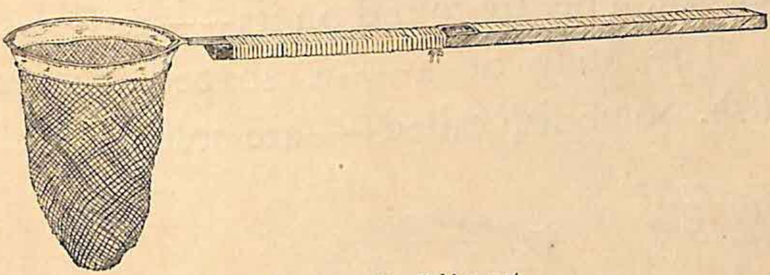
Bend a length of thick wire into the shape shown in the drawing. Tie it tightly to a thick stick. Stitch some mosquito-netting to the wire.

Bend the wire into this shape



Twist the wire





Complete this fishing-net

Outdoors:

During the week-end ask father to take you fishing. Carry a net to catch fish, and a few jam-jars full of water, to keep them alive.

In your note-book:

Choose the correct words from those in the brackets to fill in the blanks in these sentences.

(back, sardines, eyes, neck, belly, ship)

A fish has no——. Its——are never closed. Fins are found on its——and——.

The body of a——is shaped like a fish. Some fish called——are sold in tins.

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